REMARKS

Claims 1-14 and 16 are pending in the application. In the last Office Action, claims 1, 3-14 and 16 were rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement, and under 35 U.S.C. §102(e) as being anticipated by Bartholomew, et al., U.S. patent no. 6,400,708.

Applicants have amended the claims to address the 35 U.S.C. §112 and 35 U.S.C. §102 rejections.

35 U.S.C. §112, First Paragraph, Claims 1, 3-14 and 16 Written Description

1. The language cited by the Examiner as failing to comply with the written description requirement has been removed from the claims.

In the OA on p. 2, the Examiner indicated that the language added by a prior amendment "a transfer rate formed dependent on a frame length and number of bits arranged in the frame" to claims 1, 4 and 16 failed to comply with the written description requirement under 35 U.S.C. §112, first paragraph. Applicants have amended claims 1, 4 and 16 to remove the language rejected by the Examiner, and respectfully request that this rejection be withdrawn from the application.

35 U.S.C. §102(e), Claim 2 Anticipation by Bartholomew

2. Applicants have amended claims 1, 2, 4, 5, 9 and 16 and added new claims 17-21 for consideration by the Examiner that distinguish the present invention from Bartholomew.

Applicants have amended claims 1, 2, 4, 5, 9 and 16 to more distinctly claim and particularly point out that which is regarded as the invention. There are

numerous bases of distinction between the various amended claims and the disclosure of Bartholomew.

In the Description of the Related Art section of the application, on p. 1, a system which communicates ISDN over HDSL having features related to Bartholomew is described. The invention is not intended to broadly cover the general concept of multiplexing of voice and other data into a DSL link, nor does it broadly cover the eoc signaling channel per se. Instead the invention relates to synchronous transmission of voice and data over SDSL where all payload services (e.g., ISDN, voice, data) and the transport mechanism share the same overhead infrastructure (synchronization and, e.g., eoc signaling channel).

The present invention as claimed in claims 1, 2, 4 and 16, as amended, comprises a method and circuit arrangement in which data belonging to at least two terminal equipment types or services that are capable of including both voice and data are provided in a common frame—furthermore, the payload itself (e.g., ISDN or voice) and the SDSL transport mechanism are synchronous.

Claims 5 and 9 have been further amended to address the fact that payload voice services (ISDN, digitized voice) and the transmit medium SDSL share only one eoc inside the SDSL frame. As described in Bartholomew, each service and the transport medium have their own eocs which are each realized as a separate bitstream. The eocs of the voice service are carried separately in the payload, whereas the control according to the present claims, as amended, utilizes an embedded operating channel that is distinguished from that of Bartholomew. The

assignment of the logic eoc channels between the terminations may be made via addressing (original claim 11).

In more detail, the present Specification addresses a system that is capable of transmitting multiplexed voice and data services over a DSL link. The Specification (p. 1) briefly describes state-of-the-art techniques. In lines 23-30 and in Figure 2 the transport of ISDN voice services and broadband data over an HDSL link (see ETSI HDSL Standard TS 101 135, Section 7.7, pp. 111-117, November 1998) is referred to. This standard specifies how an ISDN channel (2 B + D) and 2048 kbits/s broadband data are multiplexed into HDSL frames. Bartholomew also discloses using a method for multiplexing data and voice services into a DSL link. But there are significant differences between Bartholomew's method in the HDSL standard and the present invention.

Annex 7.7 of the HDSL standard and the present invention describe different methods for transmission of broadband data and ISDN service over a HDSL or SHDSL link using a multiplexing method. In contrast to this, Bartholomew uses the ISDN frame format to transmit 64 kbits/s data service and 16 kbits/s compressed voice data, but the payload in Bartholomew's system is not an ISDN payload. Bartholomew's system is therefore not able to deliver ISDN service. The system of the present invention is designed to transmit ISDN service and/or a traditional voice service.

All services transmitted according to the present invention operate synchronously (see section III), whereas the HDSL link is asynchronous

(plesiochronous) asynchronous. Furthermore, in Bartholomew, the voice services transmitted over the ISDL and the T1 are not synchronized.

The distinction between transmission of an ISDN services and simply using the ISDN format is important. Bartholomew uses the ISDN format in order to transport compressed traditional voice service and 2 x 64 kbits/s data services transparently. However ISDN service is more than just digitized voice service. ISDN service comprises the following: 2 x 64 kbits/s B-channels for digitized voice, 16 kbits/s D-channel for higher layer signaling, control messages and a synchronous ISDN clock signal.

The present invention permits the ISDN frame to be discarded and the 2 x B voice-channels and the higher layer signaling D-channel may be transmitted as payload inside the SDSL frame. The ISON specific eoc messages can be transmitted over the SDSL eoc, not over the ISDN eoc, which has also been discarded.

The frame word of the ISDN frame can be eliminated in a transmission of the SDSL frame. The information contained in the overhead channel in the ISDN connection such as status information or a transmission control are already contained in the SDSL frame (page 5 lines 5-8). Hence, Bartholomew discloses the use of an ISDN physical layer, but no ISDN service, whereas the present invention permits the use of an ISDN service, but has no ISDN physical layer.

The synchronization aspect of the present invention is significant as well. An HDSL link is asynchronous (plesiochronous) whereas the inventive link exemplified

by an SDSL link is synchronous. (See Claim 1 line 6, claim 4 line 21, claim 14 line 7, claim 15 line 13; page 2 line 17, page 2 line 28, page 5 lines 4, 5). This is a significant difference. As stated in the Specification on p. 5, lines 3-6, "The data transmission of the data in an SDSL frame occurs synchronously in time-division multiplex. The synchronization takes place with the assistance of the SDSL clock." In this way the termination equipment at both ends is in sync and the ISDN clock which becomes identical to the SDSL clock is available.

In the method specified in the HDSL standard, the synchronization signal is transmitted inside the payload. Also, Bartholomew transmits voice-channel specific synchronization signal inside the payload, as disclosed at 9/17-20, "The switch communicates with various ISDN devices in the line using the EOC channel, for synchronization, maintenance and testing purposes."

Regarding the operational control, according to claims 9-11 of the present invention, the control channel for the service transmitted as payload (ISDN, voice) is arranged outside the payload region in the frame overhead. Multiple payload services and the SDSL transport mechanism share only one eoc, which is, e.g., the SDSL eoc. The Specification states, *"The bandwidth of the payload data can be expanded by relocation of operational bits"* into the frame (page 2 lines 25, 26). In contrast to this method, for the above described ISDN transport over HDSL, its own signaling channel is set up inside the payload.

Similarly the voice specific signaling in Bartholomew's disclosure is transmitted in a D channel inside the payload region. (Bartholomew on p. 1 Page 1,

Abstract;4/56-58; and 7/45-49). In other words, Bartholomew discloses one eoc link for each service which are transmitted in parallel. *"The EOC and 0 channels are combined on another DSO within the T1 link."* (Bartholomew 9/7-9, 17-20, 9/49-10/3 and 10/51-54.

According to the claims, as amended, the signaling is handled in a different way. Instead of setting up a separate and appertaining signaling channel in the payload region for each voice channel, as it is done in Bartholomew or in the HDSL standard, different services share the SDSL eoc. This means that the signaling of the payload (ISDN or traditional voice service) shares the control channel of the transport mechanism (SDSL). This control channel is in the frame and not in the payload. As disclosed in the Specification:

> The information contained in the overhead channel in the ISDN connection such as status information or a transmission control are already contained in the SDSL frame. Among other things. an eoc channel, also be referred to as an 'operating channel', and that is synchronized with the ISON data stream, is provided in the ISDN overhead channel. This eoc channel serves as the control channel between network equipment for operational purposes. (5/6-11).
>
> The operational control information of the respective ISDN connection are transmitted in the overhead OH of the SDSL frame, where this control information is divided into a part relating to the SVSL transmission path and into a further part that is dependent on one or more transmitted services. (6/7-10).
>
> Figure 7 shows an embodiment of the eoc address expansion necessary for the addressing of the individual ISDN connections or, respectively, traditional telephone connections. To this end, the address of the eoc channel has an auxiliary address field attached to it. The auxiliary address field comprises the components service ID and

service No that are needed for an unambiguous addressing of the respective connection. (6/11-16).

In these appertaining amended claims of the present invention, the eoc channels are not multiplexed into timeslots. Instead there are only logic channels where the assignment of the messages to the respective recipients is made via addresses in the messages.

For this reason, the Applicants assert that the amended claim language clearly distinguishes over the prior art, and respectfully requests that the Examiner withdraw the 35 U.S.C. §102 rejection from the present application.

CONCLUSION

Applicants have added claims 17-21 to the present application and believe that they are patentable over the art currently of record. Inasmuch as each of the rejections have been overcome by the amendments and arguments presented, and all of the examiner's suggestions and requirements have been satisfied, it is respectfully requested that the present application be reconsidered, the rejections be withdrawn and that this application be passed to issue.

Respectfully submitted,

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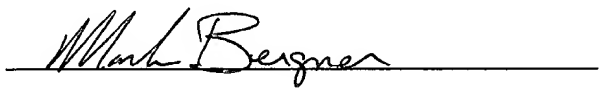

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